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भारतीय मानक

जूट कृषि वस्त्रादि — सीडलिंग/सैपलिंग की वृद्धि के लिये सैपलिंग बैग — विशिष्टि

Indian Standard

JUTE AGRO-TEXTILE — SAPLING BAGS FOR GROWTH OF SEEDLING/SAPLING — SPECIFICATION

ICS 55.080;59.080.70;65.020.20

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

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Technical Textiles for Agro-tech Sectional Committee, TXD 35

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Technical Textiles for Agro-tech Sectional Committee had been approved by the Textile Division Council.

Jute is a natural bio-degradable eco-friendly textile grade bast fibre. Various conventional products, like, sacks, Hessian cloth made from jute fibre are widely used all over the world with distinct environmental advantage. Diversified jute products, in the name of technical textiles, that is geo-textiles (for example, soil saver) and agro-textiles have entered into the fields of civil engineering, agri-horticulture and forestry. Apart from its wide uses as geo-textile for river bank protection, road construction, control of railway track settlement, embankment protection, mine spoil stabilization, etc, it has also been effectively used as agro-textile for growth of seedling/sapling in nursery. Jute agro-textile for use as sapling bag which is made from plain weave hessian cloth has been developed by Indian Jute Industries' Research Association (IJIRA). The fabric is cut and stitched with conventional lock stitch or chain stitch sewing machine to make a bag.

Jute Agro-Textiles (JAT) provides the natural answer to faster sapling growth in the nurseries. JAT is a natural fabric, made of jute fibre, that helps retain soil humidity at a conducive level, arrest desiccation of soil and attenuates extremes of temperature due to the intrinsic characteristics of jute and capacity to absorb water/moisture up to about 5 times of its dry weight. On bio-degradation, jute coalesces with soil, increasing its permeability and supplementing its nutrient level. JAT provides all these advantages without affecting eco-ambience adversely.

Uses and installation procedures of jute agro-textiles are given in Annex D for information only. The list of trials and their results are given in Annex E for reference.

The composition of the Committee responsible for the formulation of this standard is given in Annex F.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

JUTE AGRO-TEXTILE — SAPLING BAGS FOR GROWTH OF SEEDLING/SAPLING — SPECIFICATION

1 SCOPE

This standard specifies requirements of jute sapling bag made from hessian cloth to use for growth of sapling in nursery.

NOTE — Selection of size and quality of sapling bag shall be decided principally on topography of the site, annual rainfall, nature of soil, type of sapling/seedling etc.

2 REFERENCES

The standards listed in Annex A contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated in Annex A.

3 TERMINOLOGY

For the purpose of this standard, the following definitions shall apply.

3.1 Woven Jute Agro-Textile — Interlacement of warp and weft yarn to form a fabric, conforming to the specified weight, thickness, tensile strength, open area percentage, water holding capacity.

3.2 Open Area Ratio — Ratio between total area of openings in a jute agro-textile (JAT) and total area covered by the JAT expressed as percentage.

3.3 Tensile Strength — The stretching load at which a JAT sample breaks. The JAT is stretched by gripping it at two ends till its failure or break. It is expressed, in kN/m.

3.4 Drapability — Measure of a jute agro-textile to shape itself to the contours of any surface. It is a measure of 'flex-stiffness' that is binding of jute agro-textile under its own weight between two points on a surface.

4 REQUIREMENTS

The sapling bag made from Hessian cloth shall meet the requirements given in Table 1.

5 SAMPLING

Sampling shall be done in accordance with IS 14706.

6 PACKING

Packing shall be done as per IS 4744. Prolonged storage of packed material or its exposure to the open environment should be avoided.

7 MARKING

7.1 Unless otherwise agreed to between the buyer and the seller, the roll shall be stenciled with an indelible ink of any suitable colour with the following:

a) Indication of the source of manufacture;
b) Roll number of the Hessian cloth from which the sapling bag is made;
c) Product identification;
d) Length and width of the sapling bag, in cm;
e) Batch No. and date of manufacture; and
f) Any other declarations required as per law in force.

7.2 BIS Certification Marking

The sapling bag may also be marked with the Standard Mark.

7.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 1986 and rules and regulations made thereunder. The details of the conditions under which a license for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

Table 1 Requirements for Woven Jute Agro-Textile for Sapling Bag
(*Clause* 4)

Sl No.	Characteristic(s)	Requirement(s)	Tolerance	Method of Test, Ref to	
				IS No.	Annex
(1)	(2)	(3)	(4)	(5)	(6)
i)	Mass, g/m², *Min*	272	± 10 percent	IS 2387	—
ii)	Thickness, mm	1.2	± 10 percent	IS 7702	—
iii)	Open area, percent	20	± 10 percent	—	B
iv)	Threads/dm:			IS 1963	—
	a) Warp	47	+4 percent -2 percent		
	b) Weft	47	+4 percent -2 percent		
v)	Width of Hessian fabric, cm	101.5	± 10 percent	IS 1954	—
vi)	Length and width of sapling bags, cm, *Min*	As agreed		IS 9113	—
vii)	Water holding capacity, percent	400	± 10 percent	—	C
viii)	Tensile strength, kN/m :			IS 1969 (Part 1)	—
	a) Warp	11	± 10 percent		
	b) Weft	12	± 10 percent		

ANNEX A
(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
1954 : 1990	Determination of length and width of woven fabrics — Methods (*second revision*)
1963 : 1981	Determination of threads per unit length in woven fabrics (*second revision*)
1969 (Part 1) : 2009	Textiles — Tensile properties of fabrics — Determination of maximum force and elongation at maximum force : Part 1 Strip method (*third revision*)
2387 : 1969	Methods for determination of mass of jute fabrics (*first revision*)
4744 : 1991	Textiles — Packaging of jute products in rolls — Specification (*first revision*)
7702 : 1975	Method for determination of thickness of woven and knitted fabrics
9113 : 1993	Textiles — Jute sacking — General requirements (*first revision*)
14706 : 1999	Geotextiles — Sampling and preparation of test specimens

ANNEX B
[*Table* 1, *Sl No.* (iii)]

METHOD OF TEST FOR OPEN AREA PERCENTAGE

B-1 PRINCIPAL

A vertical instrument having cylindrical shape is used to measure open area percentage. Its open top end is used as sample table. On the open end of the cylinder the sample under test is spread flat. From the lower end of the cylinder, a uniformly illuminated source of light falls on the lower surface of the sample creating a shadow of the messy structure of the sample. This image is converged with a convex lens and finally falls on a photoelectric cell at the upper cover of the instrument. The output of the photoelectric cell so produced is calibrated in terms of open area percentage.

B-2 CALIBRATION

B-2.1 When no sample is kept on the top opening 100 percent light fall on photocell giving the full scale reading of the instrument (that is 100 percent open).

B-2.2 When the top is totally covered with a dark black board no light comes out and photocell gives zero output and zero reading in the scale (that is 0 percent open).

B-2.3 When intermediate illumination is obtained by keeping a sample on the top, certain intermediate reading, proportional to the open area, is obtained.

B-3 TEST PROCEDURE

Fabric is placed on the illuminated circular opening of the 'Cover factor Tester'. Open area is electronically measured by optical sensor (called Photo cell) with respect to uncovered condition. The detail of instrument is given in Fig. 1 for guidance only.

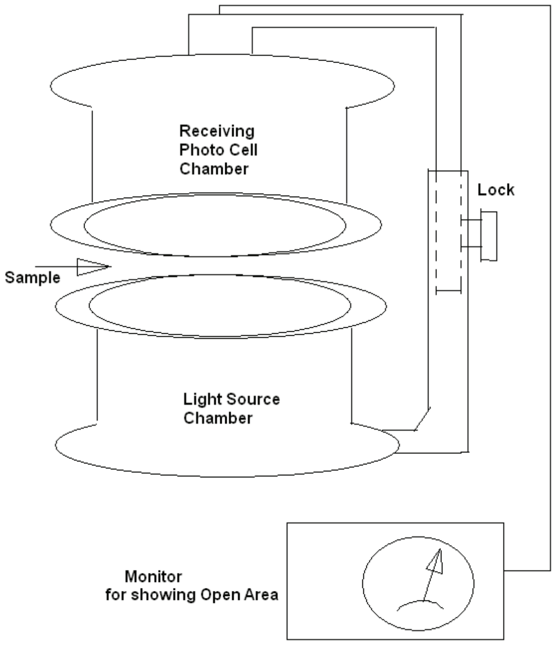

FIG. 1 APPARATUS FOR OPEN AREA TEST

ANNEX C

[*Table* 1, *Sl No.* (vii)]

METHOD OF TEST FOR WATER HOLDING CAPACITY

C-1 PROCEDURE

A known weight of fabric is taken and soaked with clean water inside a suitable container for 15 to 20 min with occasional stirring and squeezing in immersed condition. In case of hard water a small quantity of soap like P40 could be mixed in water. Then the sample is taken out without applying any pressure or squeezing force. Then it is kept on a wire-mesh so that lose and free water drops/droplets can drain out by gravitational force. After 5 to 10 min when no visible water droplet drips out, it is transferred on a polythene sheet of known wt. To determine the water holding capacity of the fabric following relationship is followed:

$$\text{Water holding capacity} = \frac{(W_2 - X) - W}{W_1} \times 100 \text{ percent}$$

where

W_1 = weight of dry sample;

X = weight of polythene sheet; and

W_2 = weight of wet sample.

ANNEX D

(*Foreword*)

INSTALLATION METHOD

D-1 The following sequence in use and installation of jute agro-textile (JAT) shall be followed.

For growth of sapling, jute sapling bag is to be filled with soil followed by placing of seed or seedling in the soil inside the bag. After growth of sapling to the desired height it would be transplanted to the ground without removing the bag.

ANNEX E

(*Foreword*)

LIST OF TRIALS AND THEIR RESULTS

Sl No.	*Site*	*Location*	*Year of Application and Users*	*Particulars of Work Done*	*Results*
i)	Andrew Yule Tea Estate	Assam	1997 Indian Tea Research Association	Seedlings/saplings Type of JAT used — Jute Sleeves 9"× 8" — 1 000 pieces	Healthy growth of sapling with survival rate of 93 percent
ii)	Indian Tea Association	Assam	1997 Indian Tea Research Association	Seedlings/saplings Type of JAT used — Jute Sleeves 9"× 8" — 500 pieces	Healthy growth of sapling with survival rate of 89 percent
iii)	Horticulture Deptt	Himachal Pradesh	1997 Horticulture Deptt, Govt of Himachal Pradesh	Seedlings growth of saplings Type of JAT used — Jute Sleeves 9"× 8" — 10 000 pieces	Result was reported to be highly satisfactory
iv)	Arunachal	Arunachal Pradesh	1998 Govt of Arunachal Pradesh	Seedlings to saplings Type of JAT used — Jute sleeves 9"× 8" — 5 000 pieces	Healthy growth of sapling with survival rate of 91 percent
v)	Chewang Nursery	Sikkim	2001 Forest & Environment Deptt, Govt of Sikkim	Seedlings growth of saplings Type of JAT used — Jute Sleeves 9"× 6"	Healthy growth with survival rate of 90 percent
vi)	Tarang Nursery	Sikkim	2001 Forest & Environment Deptt, Govt of Sikkim	Seedlings growth of saplings Type of JAT used — Jute Sleeves 9"× 6"	Healthy growth with survival rate of 90 percent
vii)	Phedang Nursery	Sikkim	2001 Forest & Environment Deptt, Govt of Sikkim	Seedlings growth of saplings Type of JAT used — Jute Sleeves 9"× 6"	Healthy growth with survival rate of 90 percent
viii)	Namprikdang Nursery	Sikkim	2001 Forest & Environment Deptt, Govt of Sikkim	Seedlings growth of saplings Type of JAT used — Jute Sleeves 9"× 6"	Healthy growth with survival rate of 90 percent
ix)	Menshithang Nursery	Sikkim	2001 Forest & Environment Deptt, Govt of Sikkim	Seedlings growth of saplings Type of JAT used — Jute Sleeves 9"× 6"	Healthy growth with survival rate of 90 percent
x)	Bop Nursery	Sikkim	2001 Forest & Environment Deptt, Govt of Sikkim	Seedlings growth of saplings Type of JAT used — Jute Sleeves 9"× 6"	Healthy growth with survival rate of 90 percent

Sl No.	*Site*	*Location*	*Year of Application and Users*	*Particulars of Work Done*	*Results*
xi)	Shimphere Nursery	Sikkim	2001 Forest & Environment Deptt, Govt of Sikkim	Seedlings growth of/saplings Type of JAT used — Jute Sleeves 9"× 6"	Healthy growth with survival rate of 90 percent
xii)	Singring Nursery	Sikkim	2001 Forest & Environment Deptt, Govt of Sikkim	Seedlings growth of/saplings Type of JAT used — Jute Sleeves 9"× 6"	Healthy growth with survival rate of 90 percent

ANNEX F

(*Foreword*)

COMMITTEE COMPOSITION

Technical Textiles for Agro-tech Sectional Committee, TXD 35

Organization	*Representative(s)*
Indian Agricultural Research Institute, New Delhi	Dr H. S. Gupta (***Chairman***) Dr T. V. S. Rajput (*Alternate*)
Business Co-ordination House Pvt Ltd, New Delhi	Shri Samir Gupta Shrimati Ritika Gupta (*Alternate*)
Central Institute of Plastics Engineering & Technology (CIPET), Bhubaneswar	Dr S. N. Yadav
Coir Board, Kochi	Director
Confederation of Indian Industry, New Delhi	Director
CTM Technical Textiles Ltd, Ahmedabad	Shri Amit Agarwal Shrimati Jyoti Agarwal (*Alternate*)
E.I.Du-Pont India Private Limited, Gurgaon	Shri Atanu Acharya
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Indian Jute Industries' Research Association, Kolkata	Shri P. K. Choudhury Shri Amal Chandra Deka (*Alternate*)
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The Bombay Textile Research Association, Mumbai	Shri V. K. Patil Shri C. H. Sakharkar (*Alternate*)
The Synthetic & Art Silk Mills Research Association, Mumbai	Dr Manisha Mathur Shrimati Manisha A. Hira (*Alternate*)
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Member Secretary
Shri J. K. Gupta
Scientist 'C' (TXD), BIS

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Amendments Issued Since Publication

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